2018 2018 vol.14 N12

Vector modeling for diagnostics of future mathematics teacher methodical training in higher school

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018 by the authors. The relevance of the present research is defined by the necessity of improvement of methodical training of mathematics teacher in a higher educational institution on the basis of multi-component diagnostics of competencies which represent the multidimensional result of education. Such diagnostics is preferable to be carried out by means of multidimensional vectors which allow not only assessing the educational process from different points of view but also predicting correction of its problematic zones. Purpose of the article is to develop vector method for diagnostics of future mathematics teachers' methodic competencies. The proposed method of vector modeling promotes qualitative and quantitative assessment of the results of methodical training of future mathematics teacher from the point of view of intensity (by means of absolute characteristics) and orientation (in relation to cognitive, activity or value-based components). The article determines such directions of the model of mathematics teacher methodical training as cognitive, social and humanitarian, operational-activity-related, research and methodical. Each of them corresponds to certain competence: information-methodological, social interaction, individual cognitive activity, self-organization and self-management and also system-activity-related. Criteria for assessment of competencies on the basis of performance of methodical oriented practice tasks and projects were developed.

http://dx.doi.org/10.29333/ejmste/94603

Keywords

Competence diagnostics, Mathematics teacher, Mathematics teaching, Methodical training, Vector modeling

References

[1] Asadullin, R. M., Teregulov, F. S., Koletvinova, N. D., & Egamberdieva, N. M. (2016). Fundamental and applied education-a new look. IEJME. Mathematics education, 11(1), 23-33. https://doi.org/10.12973/iser.2016.2103a

[2] Asadullin, R. M., Borisenkov, V. P., Gukalenko, O.V., & Rozov, N. Kh. (2016). Reform of teacher education and teacher development system. Bulletin of Moscow University. Series 20: Pedagogical Education, 1, 3-6

[3] Borovskikh, A. V., & Rozov, N. Kh. (2010). Activity principles and pedagogical logic. Pedagogy, 8, 10-19

[4] Chang, Y. L. (2015). Examining Relationships among Elementary Mathematics Teacher Efficacy and Their Students' Mathematics Self-efficacy and Achievement. EURASIA Journal of Mathematics, Science and Technology Education, 11(6), 1307-1320. https://doi.org/10.12973/eurasia.2015.1387a

[5] Dorofeev, A. V., & Latypova, A. F. (2014). Multidimensional diagnostics of the competence-oriented mathematical education at university. Bulletin of Bashkir University, 19(1), 253-258

[6] Dorofeev, A. V., & Latypova, A. F. (2015). The Vector Model of Competence Diagnostics. Mediterranean Journal of Social Sciences, 6(4), 11-21. https://doi.org/10.5901/mjss.2015.v6n4s4p

[7] Dorofeev, A. V., & Piadina, J. V. (2014). Design of multi-dimensional mathematical training. European Journal of Natural History, 3, 13-15

[8] Dorofeev, A. V., & Arslanova, M. N. (2017). The principle of multidimensionality in the design of the nonlinear educational process of the future teacher. Pedagogical Journal of Bashkortostan, 3(70), 57-63. https://doi.org/10.21510/1817-3292-2017-3-57-63

[9] Gok, T. (2014). Students' Achievement, Skill and Confidence in Using Stepwise Problem-Solving Strategies. EURASIA Journal of Mathematics, Science and Technology Education, 10(6), 617-624. https://doi.org/10.12973/eurasia.2014.1223a

[10] Gross, J., Robitzsch, A., & George, A. C. (2016). Cognitive diagnosis models for baseline testing of educational standards in math. Journal of Applied Statistics, 43, 229-243. https://doi.org/10.1080/02664763.2014.1000841

[11] Karaseva, L. M., & Dorofeev, A. V. (2015). Cluster Model of Formation Multidimensional Information Competence of Student. Eastern European Scientific Journal, 3, 134-137. https://doi.org/10.12851/EESJ201501C04ART0

[12] Khutorskoy, A. V. (2002). Core competencies and educational standards. Internet-journal "Eidos". Retrieved from http://www.eidos.ru/journal/2002/0423-1.htm

[13] Kirikovich, T. E. (2014). The humanistic bases axiological the directed, nonlinear personal didactic model of self-training. Modern problems of science and education, 1. http://science-education.ru/ru/article/view?id=12068

[14] Kiseleva, O. M., Timofeeva, N. M., & Bykov, A. A. (2013). The formalization of elements of the educational process on the basis of mathematical methods. Modern problems of science and education, 1, 224-132. http://science-education.ru/107-8283

[15] Kolokolnikova, Z. U., Zakharova, T. V., Yakovleva, E. N., Lobanova, O. B., Korshunova, V. V., & Farhutdinova, T. G. (2015). The development of universal competencies of a future teacher in educational and extracurricular activities. Modern problems of science and education, 3. http://science-education.ru/ru/article/view?id=23811

[16] Latypova, A. F., & Dorofeev, A.V. (2016). Point-rating system as a means of implementing the vector model of multidimensional diagnostic results of learning. Modern problems of science and education, 4, 156-162. http://science-education.ru/ru/article/view?id=24937

[17] Li, J., & Shieh Ch. J. (2016). A Study on the Effects of Multiple Goal Orientation on Learning Motivation and Learning Behaviors. EURASIA Journal of Mathematics, Science and Technology Education, 12(1), 161-172. https://doi.org/10.12973/eurasia.2016.1221a

[18] Liu, O. L., Wilson, M., & Paek, I. (2008). A Multidimensional Rasch Analysis of Gender Differences in PISA Mathematics. Journal of applied measurement, 9(1), 18-35. http://ncbi.nlm.nih.gov/pubmed/18180547

[19] Naziev, A. Kh. (2000). Humanitarization of the foundations of special training for mathematics teachers in pedagogical universities (PhD Thesis). Moscow: Moscow Pedagogical State University

[20] Nurullin, R. A. (2013). Philosophic Problems of Correlation between Professional Education and Education in General. Middle-East Journal of Scientific Research, 17(2), 226-232. https://doi.org/10.5829/idosi.mejsr.2013.17.02.12186

[21] Nurullin, R. A. (2014). Personality Formation and Education in Multicultural Field of Social Life. Middle-East Journal of Scientific Research, 21(1), 38-42. https://doi.org/10.5829/idosi.mejsr.2014.21.01.21174

[22] Ostapenko, A. A. (2007). Modelling of Multidimensional Pedagogical Reality: Theory and Technology. Moscow: Public Education

[23] Pino-Fan, L. R., Assis, A., & Castro, W. F. (2015). Towards a Methodology for the Characterization of Teachers' Didactic-Mathematical Knowledge. EURASIA Journal of Mathematics, Science and Technology Education, 11(6), 1429-1456. https://doi.org/10.12973/eurasia.2015.1403a

[24] Shteinberg, V. E. (2002). Multidimensional Didactic Instruments: Theory, Methods, Practice. Moscow: Public Education

[25] Shteinberg, V. E. (2015). Theory and practice of didactic multidimensional technology. Moscow: Public Education

[26] Tchoshanov, M. A. (2011). Engineering of teaching technologies. Moscow, BINOM

[27] Tchoshanov, M., Lesser, L., & Salazar, J. (2008). Teacher knowledge and student achievement: Revealing patterns. Journal of Mathematics Education Leadership, 13, 39-49

[28] Tkachenko, E. V., Shteinberg, V. E., & Manko, N. N. (2016). Didactic design-'tools'' approach. Pedagogical Journal of Bashkortostan, 1(62), 51-66

[29] Yalalov, F. G., & Kaiumova, L. R. (2015). Psychological Bases of Professional Multidimensionality. The Social Sciences, 10(6), 883-887. https://doi.org/10.3923/sscience.2015.883.887

[30] Vasil'yev, V. I. (2012). Principles of constructing individual educational trajectories based on self-organization of students. Pedagogical Journal of Bashkortostan, 5(42), 59-66